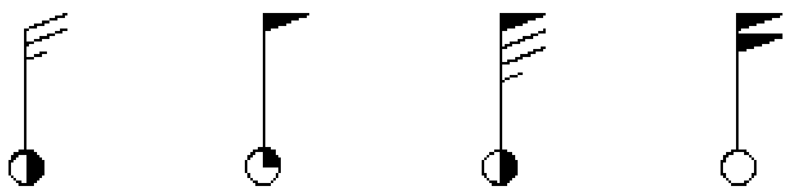
The Champlain Weather Chronicle



Volume 10 Number 2 Oct 2008

**From your North Country's
National Weather Service Office in
Burlington, Vermont**

South Hero, VT Observer Receives John C. Holm Award

By Jerry Macke

Ray Allen of South Hero, VT was presented with the John Campanius Holm award in recognition of 39 years of service to the National Weather Service (NWS) and to his community. The award was presented to Ray by Andy Nash, Meteorologist-in-Charge of the Burlington Vermont Weather Forecast Office (WFO), on July 7th 2008. Also in attendance were Dean P. Gulezian, NWS Eastern Region Director and Gerald Macke, WFO Burlington Observation Program Leader.

The John C. Holm award is presented to COOP observers with at least 20 years of service. Observers must record daily weather reports in an accurate and dependable manner. Ray has excelled during the last 39 years; he has missed very few reports and has a flawless reporting record for the past 10 years. Reporting daily weather has not always been easy. During January 1998, a massive ice storm blanketed the area with up to three inches of ice. Despite eight days of power outages plus his duties as Chief of the South Hero Rescue Department, Ray continued to record daily weather conditions.

Ray's community involvement doesn't stop with the COOP program. His involvement in the community includes helping in the establishment of the Rescue Department for South Hero in 1973 and has been the Rescue Chief the entire time. Ray served as President of the Chittenden County Fair for many years and has been on the Fair Board for the last 40 years. As Justice of the peace, Ray monitors elections and has married over 100 couples. He is an avid supporter of the Red Cross, donating over 34 gallons of whole blood and platelets. He also makes and serves apple pies during Red Cross blood drives. Ray has received an Honorary Doctorate from the University of Vermont and was honored by the Vermont General Assembly for his service to the South Hero community.

The John Campanius Holm Award gives recognition to cooperative weather observers for their outstanding accomplishments in the field of meteorological observations. The award is named after John Campanius Holm, a Lutheran Minister. He was the first known person to have taken weather observations in the American Colonies between 1644 and 1645. Holm Awards are presented to no more than 25 observers each year and are selected from a nationwide network of over 11,000 sites.

Ray Allen receives the John Campanious Hold award for 39 years of service.
Pictured from left to right are Jerry Macke, Ray Allen, Andy Nash, and Dean Gulezian.

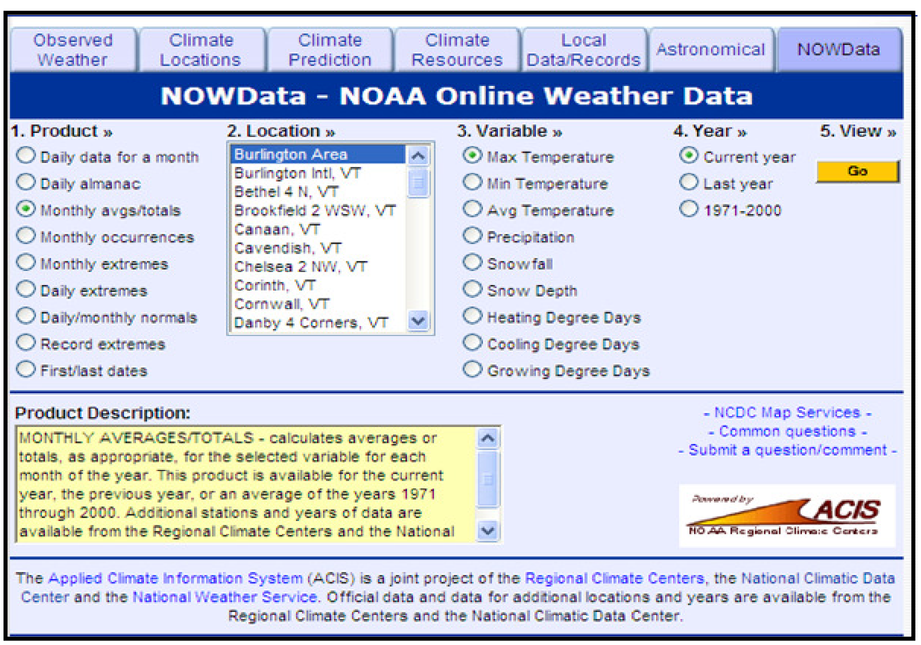
How Are COOP Reports Used?

By Gerald Macke

The National Weather Service (NWS) Cooperative Observer program (COOP) was created in 1890 under the Organic Act. The program has two missions. The first mission is to provide meteorological observations, usually consisting of daily temperature, snowfall, and precipitation values, which are required values that define the climate of the United States. The second mission is to provide meteorological data in near real-time to support forecast, warning and other public service programs of the NWS. How this data is used by the NWS and where you as the public can view this priceless meteorological data will be explained in this article.

The repository for climate data in the United States is the National Climatic Data Center (NCDC) in Ashville, NC. Each month, they digitize paper records, quality control data and archive reports from airport, COOP stations, ships, buoys, and other sources. Their records reach back into the 1800s with more that 8000 active COOP sites today. Climate information has numerous uses ranging from developing specifications for billion dollar construction projects to picking the best dates for a vacation. NCDC provides certified weather observations for legal proceedings, lets farmers use climate to maximize crop yields, and allows the governmental agencies to anticipate and plan for natural disasters.

Official World Wide climate records are available through NCDC; however, un-official local climate data is also available through your local NWS Weather Forecasting Office (WFO) web-site. Here at WFO BTV, you can obtain normal and extreme temperature, precipitation, snowfall and Heating/Cooling degree day data for 44 COOP stations spread across much of Vermont and Northern New York. This interactive program allows the user to obtain data for the current year, the previous year, or the 30 year average from 1971 through 2000. To access this data, go to the BTV WEB site at *http://weather.gov/btv*. Once on the main page select "More" under "Climate" on the left side menu, then select the icon labeled "NOWData" tab near the top of the page. The "NOWData" page is shown in the image below.



Interactive "NOWData" Webpage

Automated weather observations like those transmitted from airports provide forecasters with an hour by hour record of weather conditions. Unfortunately, these systems are very expensive and are located in only a handful of locations across the forecast area. COOP reports are spaced no more that 25 miles apart and help fill in the blanks between airports. These reports help the meteorologists create forecasts which more accurately represent actual conditions across most of the area.

Daily weather observations are provided in two forms on the BTV WEB page. Text summaries of COOP reports are created daily at 9:30 AM and 5:30 PM, these products are disseminated to the news media using a Hydrometeorological Data Message (HYD). This product is found by clicking on "Coop Observer Obs" in the left column. The thirteen previous HYD messages are also available, providing the last seven days of reports. The second way to view the COOP data is by viewing the Daily climate maps that show maximum and minimum temperatures, precipitation, snowfall and snow depth. These maps are created daily around 10:30 AM and posted on the NWS website. These maps were discussed in detail in the November 2007 issue of the Champlain Weather Chronicle and can be found on the BTV WEB site by looking under the "Jump to Popular Links" menu in the middle of the main page.

COOP and spotter reports play a key role in issuing and verifying forecasts, warnings and advisories. Meteorologists compare forecasted temperature and precipitation values to actual weather observations. This allows them to make adjustments to the computer output, improving forecast accuracy and providing a better product to the public. Computer models themselves also use COOP data to help create tailored temperature and snowfall forecasts for around 5400 COOP stations throughout the country. The model creates output then uses algorithms based on climatological data and skews the forecast output values. These forecasts are generated daily using the GFS computer model and are available on the internet at *http://weather.gov/mdl/synop/coop.php*. Snowfall, heavy rain and storm damage reports from spotters, COOP observers and the general public are especially valuable. During storms, these reports are used to adjust warnings and give details to storm statements. Warnings are often extended or canceled based largely upon feedback from the public.

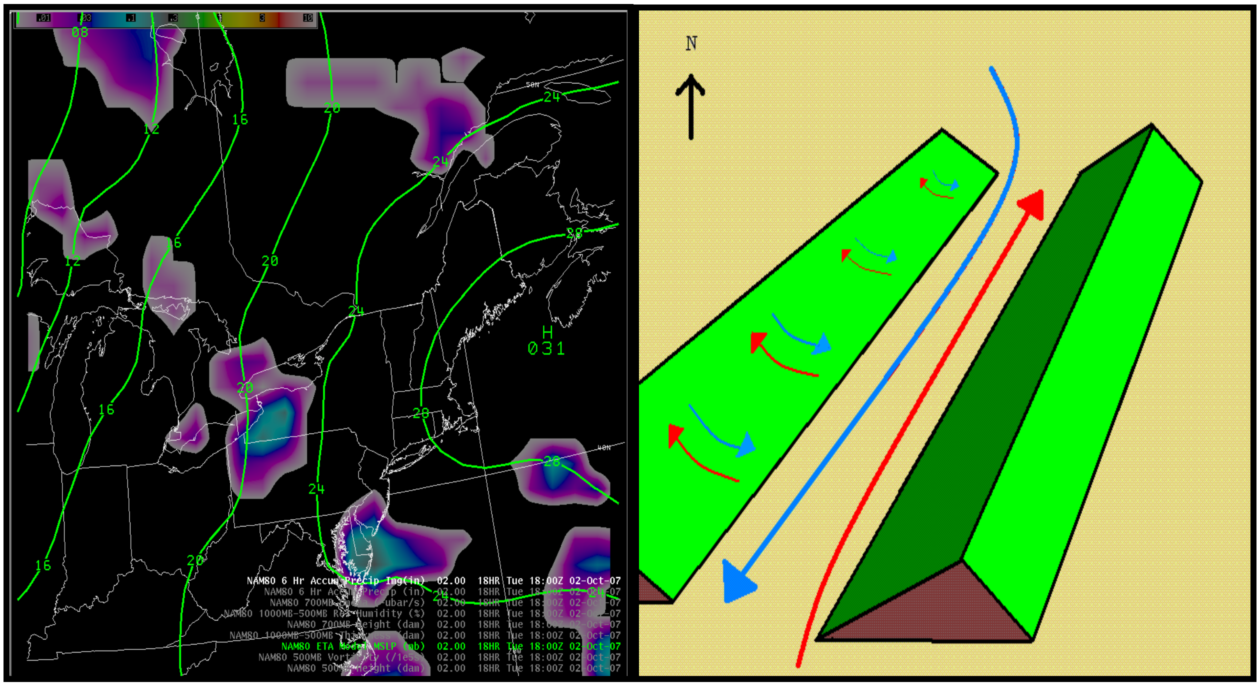
To summarize COOP Observers play two important roles in National Weather Service operations. They provide daily weather reports over extended periods of time, which defines the climate of the United States. They also provide crucial feedback to local meteorologists resulting in better forecasts and more accurate warnings. The data provided by thousands of dedicated volunteer weather observers is readily available on the internet at local NWS WEB sites. The COOP program which was started over 100 years ago is more important that ever, thanks to the dedication of these volunteer weather observers.

Forced Wind Channeling in the Champlain Valley

(Impacts to Marine Conditions on Lake Champlain)

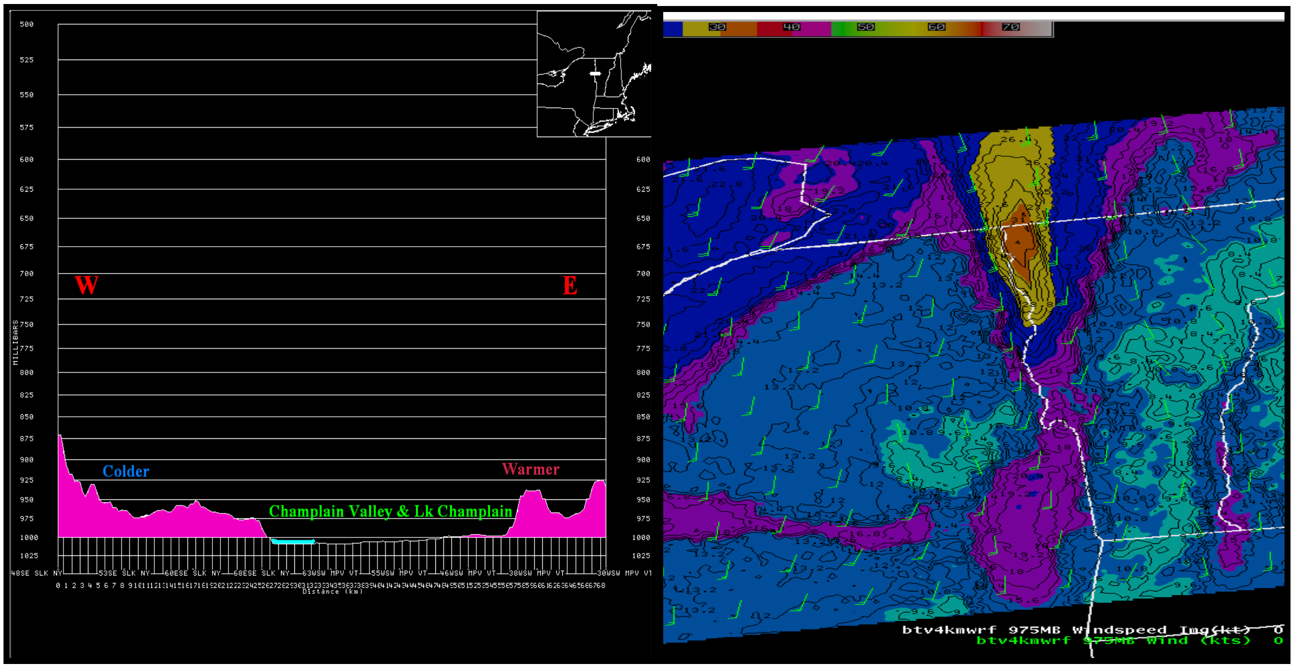
By John Goff

Forecasters at the National Weather Service in Burlington have long noticed the existence of enhanced low-level winds in the Champlain Valley of Vermont and northern New York. These winds are often channeled, governed by the north-south orientation of the valley's axis. Channeling of valley winds is a commonly observed phenomenon throughout the world, but the causes of their formation may vary. In the Champlain Valley, these winds are driven by a concept known as "forced channeling". Forced channeling occurs when winds are forced to align with the valley's long axis, and are channeled by the valley's side walls. During this process, the flow becomes constricted and accelerates to speeds higher than surrounding areas. As a result, these enhanced or channeled winds may have significant impacts to marine and aviation interests in the valley. The most prevalent direction of these winds in the Champlain Valley are from the south, and they typically occur as a high pressure system moves east of New England and southerly return flow commences across the area (see images below).



The image on the left shows typical weather pattern occurring during channeled wind events in the Champlain Valley. Note the high pressure center, indicated by the (H) off the southern tip of Nova Scotia, with mean sea level pressure lines (green) indicating southerly return flow in the valley. The image on the right shows a schematic of typical channeled flow direction (long blue and red lines) in an elongated valley. Shorter blue and red lines depict smaller-scale slope flows.

Of particular interest is the development of localized relatively strong winds concentrated within a narrow stream in the atmosphere and is referred to as a “jet” or “jet stream” by meteorologists. This “low level” jet typically develops 1000-2500 feet above the ground and attains speeds of 20 to 35 knots within the broader channeled flow during these southerly wind regimes. While these can occur any time of year, their occurrence and impacts at the surface are felt most often in the late summer into the autumn months, especially October through December. During these periods, surface wind speeds may exceed 30 knots, especially over the relatively warmer waters of Lake Champlain where marine boundary layer instability exists. When cold air travels over a warm body of water, the boundary layer or lowest level of the atmosphere becomes unstable and mixing of the air occurs. A close examination of these events through observational and weather model data seem to suggest that these jets have a somewhat higher frequency of occurrence at night, and tend to be aligned along the eastern side of the valley. This appears reasonable given the flatter nature of this area compared with the sharp rise into the Adirondacks to the immediate west. This may explain the jet’s higher nocturnal frequency given the boundary layer remains mixed over the lake, and becomes decoupled over land during this time. When these events occur during the fall, the higher wind speeds are readily mixed to the surface over Lake Champlain, where marine boundary layer instability exists due to the lake’s relatively warmer water temperatures (see below).



The image on the left shows a cross-section of the Champlain Valley and Lake Champlain (blue line) in center, with Green Mountains to the east (right in pink) and Adirondack Mountains to the west (left in pink). Note the larger area of higher terrain to the west of the valley, which may explain why the thermal wind gradient may play a role in low-level jet formation. The image on the right shows a low-level jet episode occurring in the Champlain Valley on October 3, 2007. 1000 foot winds above the ground are shown, with maximum winds (orange shading) around 30 knots occurring in the northern portions of the valley and over Lake Champlain.

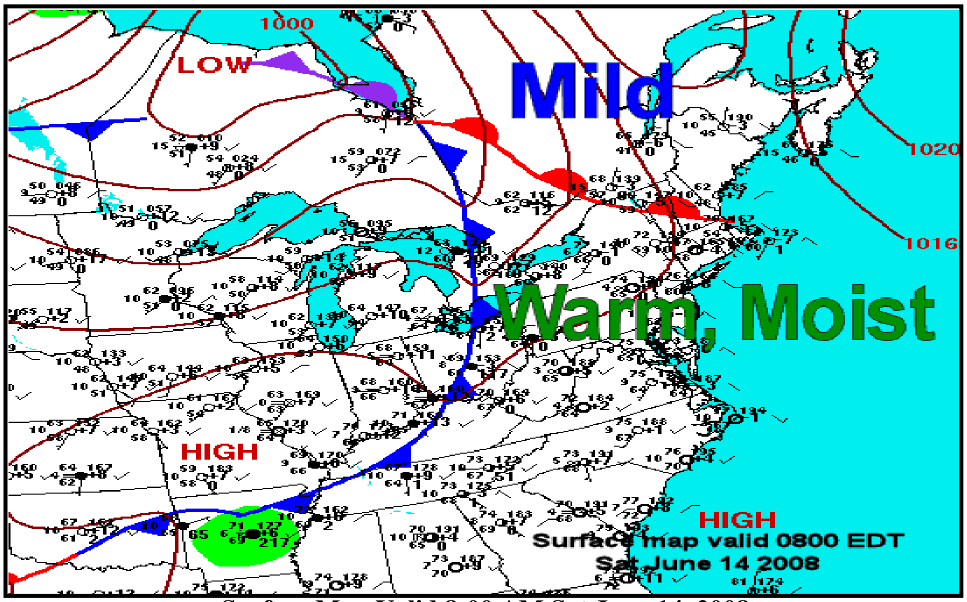
While the causes of the jet's formation remains a subject for debate, it is obvious that during a low-level jet episode during the late summer or fall significant impacts to marine weather conditions often occur, and may lead to locally hazardous conditions for small craft operating on Lake Champlain. Sustained winds of greater than 30 knots on the open waters often produce very choppy conditions, with wave heights averaging 2 to 4 feet in many areas. Thus the predictability and detection of these events is often critical to those with recreational interests on the lake such as boaters, hunters, and wind surfers. The National Weather Service in Burlington coordinates closely with the U.S. Coast Guard whenever these events occur, with current marine forecasts broadcast on NOAA Weather Radio, and made available on the web at http://weather.gov/btv/. Graphical representations of wind speed and wave heights are also available at this site, which make a nice complement to extant text forecasts for the lake. For more information on forced wind channeling in the Champlain Valley and its effects, please contact John Goff at john.goff@noaa.gov.

Wet -n- Wild Summer in the North Country

By Gregory Hanson

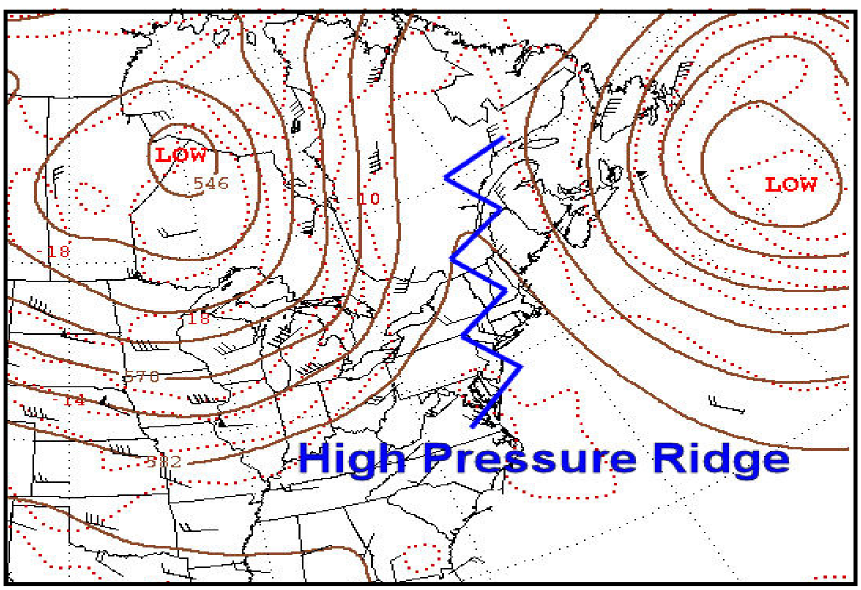
This summer saw several episodes of very heavy rainfall, mainly in central Vermont which lead to historical summer rainfall amounts in some locations. There were several instances of flash flooding that kept forecasters busy, and caused damage to numerous roads and even some structures. The heaviest rainfall happened over a 60 day period, beginning in mid-June and ending in mid-August.

The image below shows on Saturday June 14 2008, a weak stationary front was draped across central Vermont, and was a focus for thunderstorm development. Atmospheric moisture levels were running about double their normal amounts, and provided the fuel for heavy rainfall.



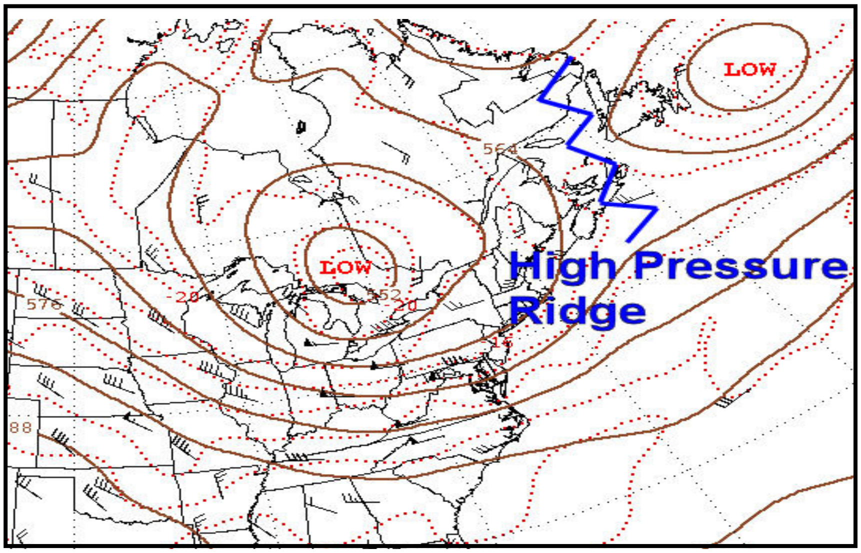
Surface Map Valid 8:00 AM Sat June 14, 2008

In the upper levels of the atmosphere on June 14, a ridge of high pressure over New England was being squeezed between an area of low pressure moving southeast through Ontario, and another low centered over the north Atlantic (see the image below). The ridge of high pressure over New England provided weak steering currents that favored very slow or even backward storm motion on June 14, allowing thunderstorms to remain stationary or re-develop over the same areas.



Upper Air Pattern Valid 8:00 AM Sat June 14, 2008

Over the coming days the ridge of high pressure moved slowly eastward as the upper level low pressure system moved south and east into the Great Lakes region by the morning of June 17th (below).

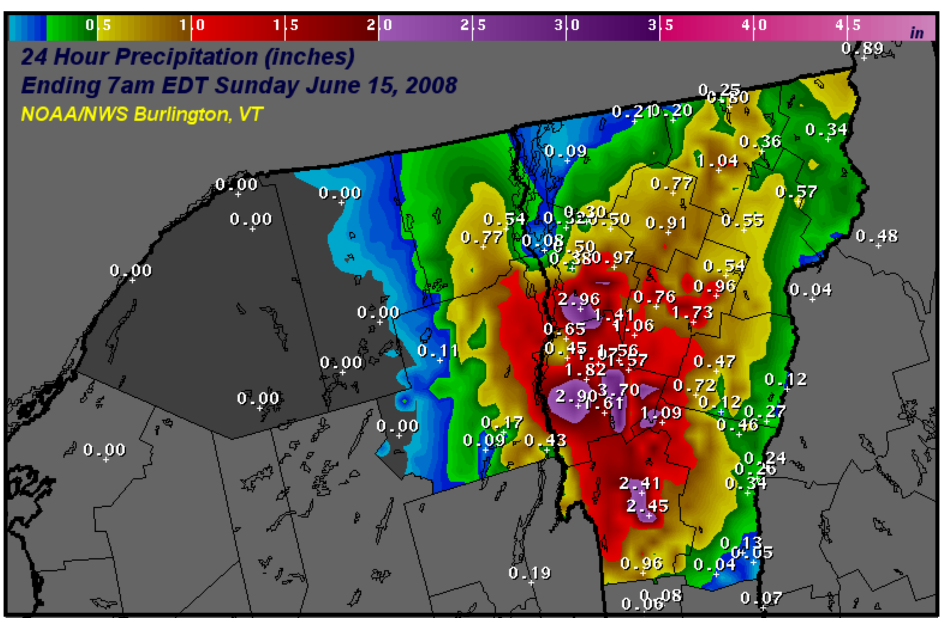


Upper Air Pattern Valid 8:00 AM Tue June 17, 2008

Thunderstorms began the afternoon of June 14 and continued to redevelop and move along the cold front through the evening. The higher terrain of the Green Mountains in Addison and Rutland counties provided an additional focus for storms.

There were areas in excess of 3 inches of rain in southern Addison and Rutland counties, with isolated reports of over 5 inches of rain in just a few hours producing flash flooding. The city of Rutland and the towns of Ripton and East Middlebury were particularly hard hit. In Rutland, there was extensive street flooding as storm water drainage was quickly overwhelmed. Several businesses and state offices were impacted by basement flooding. In Ripton and East Middlebury VT, the heavy rainfall and steep terrain combined to wash out several roads. Culverts were overwhelmed and dirt roads were severely eroded. Outside the flash flood areas across the remainder of the forecast area rainfall totals ranged from a quarter of an inch to more than two and a half inches of rain in isolated areas.

The image below shows rainfall totals for NWS Burlington's forecast area for the 24 hours ending at 8 am Sunday June 15. Although spotter reports in excess of 5 inches are certainly credible, this analysis contains data only from official NWS Cooperative Observers and automated rainfall stations.



Rainfall totals for NWS Burlington's forecast area for the 24 hours ending 8 AM 15 June 2008.

The active weather pattern continued through June 17th with a weak surface boundary and a slowly advancing upper level low pressure system providing the focus for thunderstorm development. The warm and very humid air remained locked over the North Country, and continued to provide the fuel for strong to severe thunderstorms and heavy rainfall. Strong storms with heavy rain developed on a daily basis from June 15 to 17, but they moved with enough speed to limit rainfall over any one location, and there was no significant impacts reported.

From late June into the first half of July there was a break in the wet weather and then strong storms and heavy rainfall returned later in the month and continued into mid August.

Things picked up again in mid July with several days of scattered afternoon and evening thunderstorms that produced localized heavy rainfall in Vermont. No flooding occurred this week but the rain did saturate the soil in many locations. Then on July 23 and 24 another unseasonal strong upper level low pressure system began to make its way east, sliding over the forecast area and ultimately out to sea. A deep sub-tropical moisture fetch developed ahead of the upper trough, ushering in abundant moisture into the forecast area. The heaviest and most widespread rainfall occurred in Vermont, where rainfall amounts were in the 1- to 2.25-inch range both July 23rd and July 24th. Two-day rainfall totals of 2 to 3 inches were common across much of Vermont, with isolated amounts of 3.5 to 4 inches reported.

This precipitation on top of the substantial antecedent rainfall proved to be too much, with the first reports of flooding coming in on the afternoon of the 24th. The flooding was most extensive in Northern and Central Vermont, with roads closures due to high water reported in Waterbury, Lyndon, East Montpelier, and Lowell. Near Eden, VT, 140 boy scouts and supervisors were stranded when the road leading to their camp was washed out by rising water. The Missisquoi River at North Troy, the East Branch of the Passumpsic at East Haven and the Lamoille River at Johnson all went above flood stage during the evening and overnight hours of the 24th into the 25th, with the Passumpsic and the Wells River exceeding action stage.

The very wet pattern continued into August as persistent upper level low pressure systems traversed the area. This produced several rounds of excessive rainfall leading to scattered though locally damaging flooding, including a devastating flash flood along the upper reaches of the White River in Hancock, Vermont on August 6th. The first of these systems dropped southeastward from the upper Great Lakes during the 1st through the 3rd, producing widespread 2 to 5 inch totals across the eastern half of the forecast area during the period, with the heaviest burst occurring during the evening and night of the 2nd and 3rd. Several areas of flash flooding were noted, mainly in areas around Derby, Moretown, and Middlesex Vermont. Most of these incidents however, were fairly small in magnitude. Of note during this time period was the failure of a beaver dam on August 2 in Wallingford, which washed out portions of Route 140.

A weak surface high pressure system brought a brief respite during the 4th and 5th, then an unseasonably cold and deep upper trough once again settled across the northeastern states on the 6th and persisted through the 12th. With soils remaining nearly saturated from excessive rainfall just a few days earlier, this additional rainfall led to the most significant flash flooding of the year.

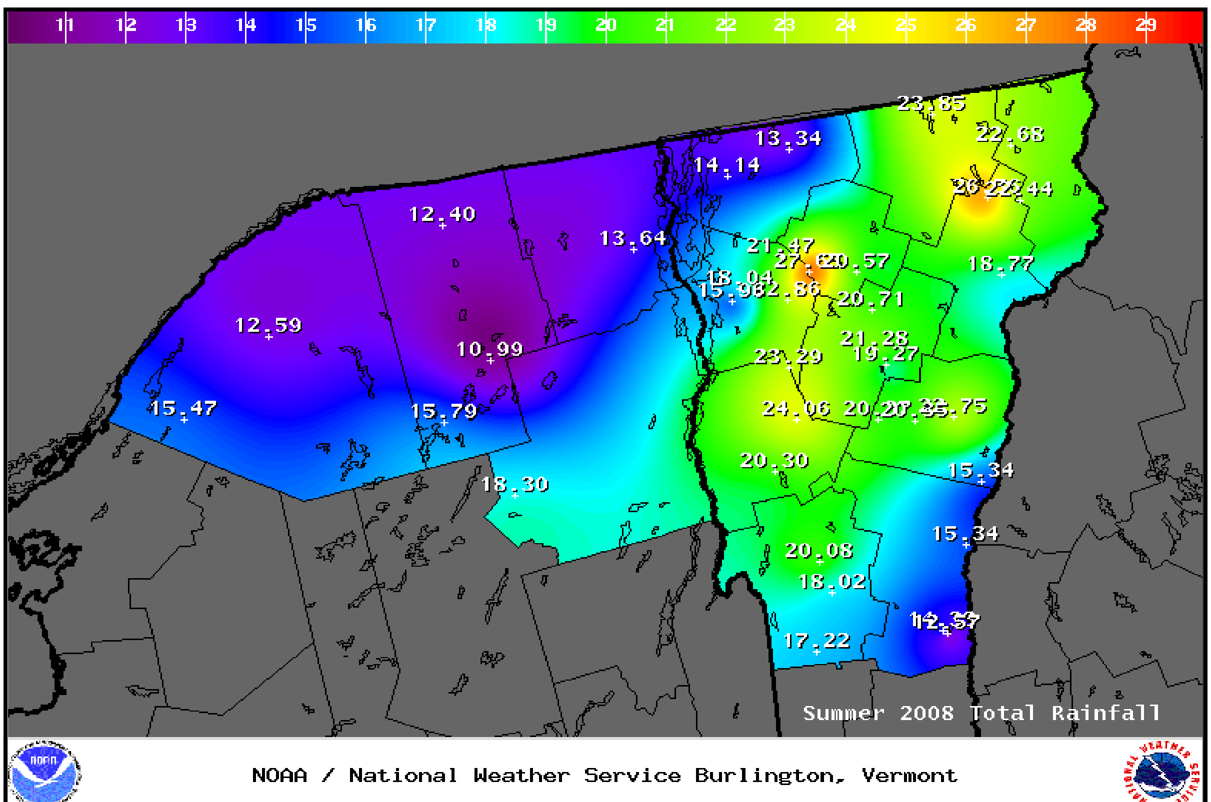
The most severe event occurred across the central Green Mountains during the late morning and early afternoon hours on the 6th. A widespread swath of 3 to 5 inches of rain led to severe flash flooding along the upper reaches of the White River and its tributaries, isolating many residents and severely damaging homes and many roads in the area. Severe damage was reported in many towns, including Hancock, Leicester and Ripton where roads and highways such as Routes 100 and 125 were closed for some time. Additional heavy rainfall on the order of 2 to 3 inches fell across portions of Caledonia County VT on the 6th, and damage was reported in Danville and West Barnet where several roads were washed out. Routes 2 and 15 around Danville were also impacted.

On August 7th, the focus for the worst flash flooding was Orange and Washington Counties where upwards of 3 inches of rain occurred in slow moving thunderstorms during the afternoon and evening. Water flowed over many roads in the towns of Chelsea, Corinth and Montpelier forcing them to be closed. Isolated locations, such as Troy (Orleans County) and Ferrisburgh (Addison County) also suffered flash flood damage from heavy but local rainfall. Officials in Ferrisburgh reported 2 to 3 inches in less than an hour that resulted in several roads being washed out along with a small landslide on private property near Button Bay.

By mid-August the persistent pattern that the region seemed to be stuck in, broke down with high pressure returning to the North Country. The table below shows very impressive one month rainfall amounts across Central Vermont locations. The image on the next page shows summer total rainfall amounts from COOP observers and ASOS measuring equipment. Notice how the Saint Lawrence valley and SE Vermont where spared from the most significant rainfall. Overall numerous Central and Northern Vermont locations broke their all time summer month's rainfall records.

Location	Rainfall (in)
Mt Mansfield (Lamoille County)	14.33
South Lincoln (Addison County)	14.05
Corinth (Orange County)	13.28
East Haven (Essex County)	12.92
Worcester (Washington County)	12.84
Montpelier (Washington County)	12.46
Sutton (Caledonia County)	12.21
Saint Johnsbury (Caledonia County)	11.77
Island Pond (Essex County)	11.77
Jay Peak (Orleans County)	11.69
Bethel (Windsor County)	9.08

Rainfall Totals (inches) at select locations for the period July 15-August 14, 2008



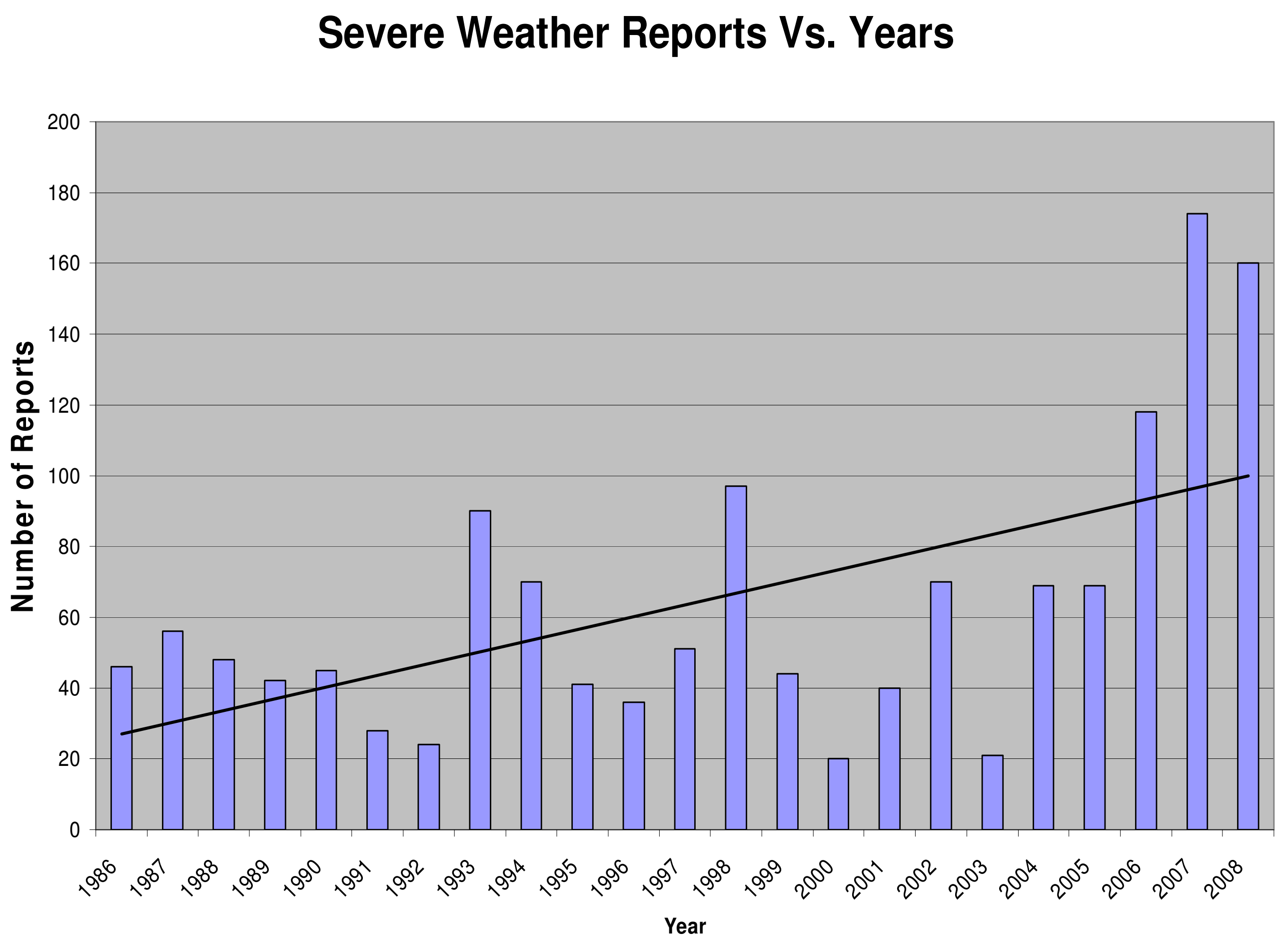
Jun 1st – Aug 30th Summer Rainfall Total

Increased Severe Weather in the North Country

By Brooke Taber

Recent data shows Northern New York as well as Central and Northern Vermont have received an increase in severe weather. Numerous factors have contributed to the increase in severe weather reports and events across the North Country over the past 20 years. We will investigate the possible factors that have led to the increase in severe weather and examine the actual severe weather data from 1986 to 2008. Remember a thunderstorm is described as "severe" by the National Weather Service if wind gusts reach 58 mph or faster, if hail is 0.75 of an inch in diameter or larger, or if the thunderstorm produces a tornado.

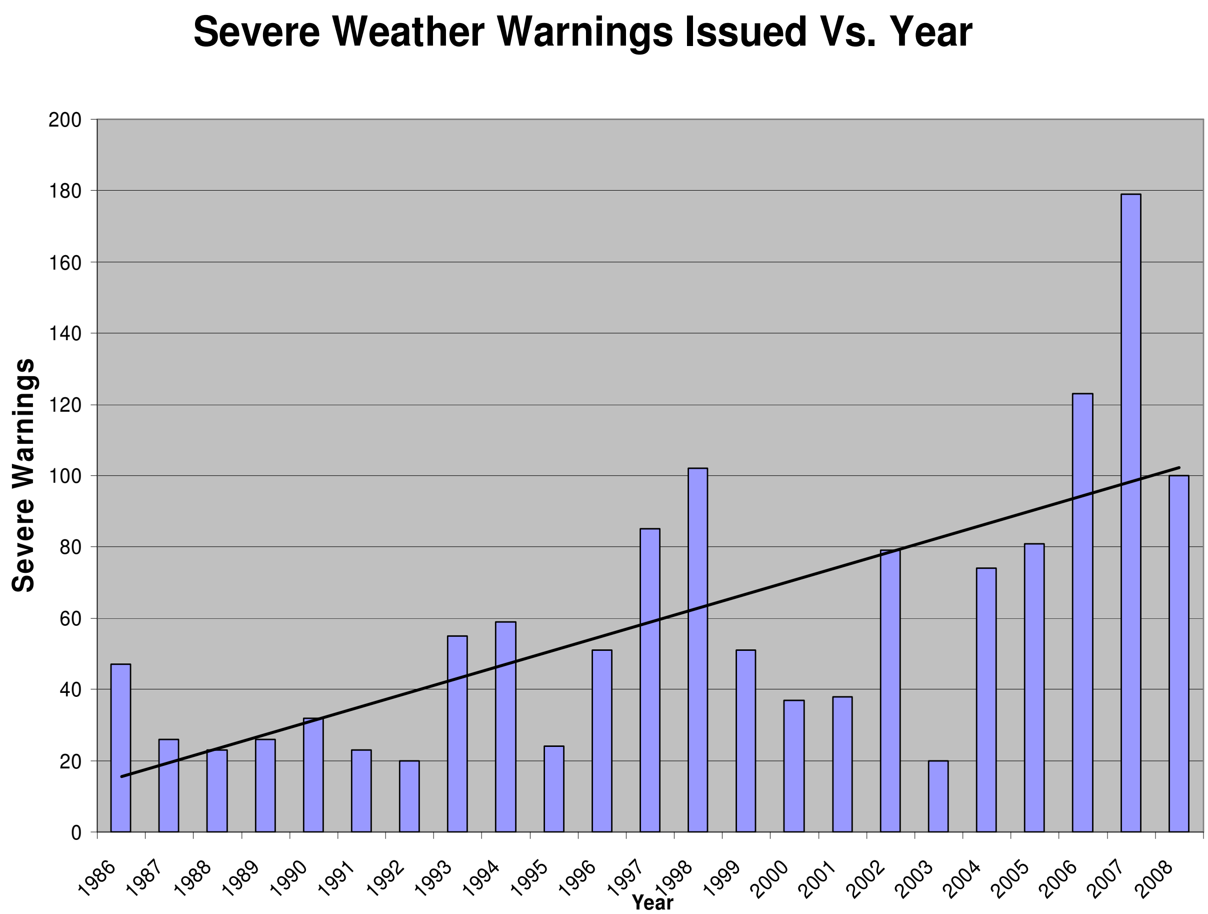
The image on the next page shows the number of severe weather reports across the Weather Forecast Office (WFO) Burlington (BTV), Vermont, county warning area (CWA) from 1986 to 2008. In addition, the black line shows a linear analysis, which indicates a steady increase in the number of severe weather reports from 1986 to 2008.



Number of Severe Weather Reports in the Burlington Forecast Area 1986-2008

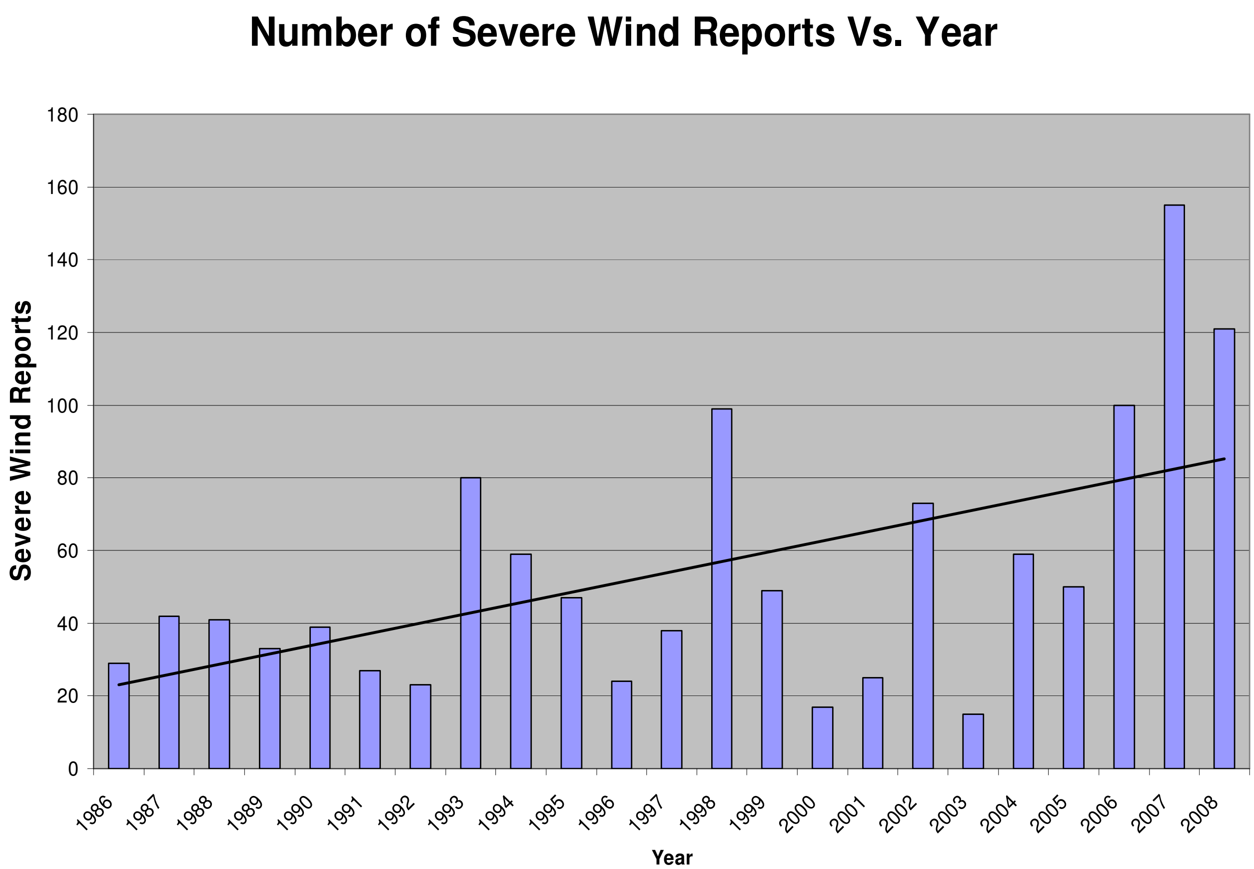
Note the sharp increase in the number of severe weather reports from 2006 to 2008. In 2007 we reported a record 239 severe weather reports, with a minimum of 24 reports in 1992 and 2003.

The increase in severe weather reports are a direct result of several important factors. First, the WFO BTV has greatly increased its trained spotter network over the North Country by 300 to 500 spotters since 2004. This increase in public weather awareness and better communications, due to the advent of cell phones and internet, with the NWS has enhanced the number of severe weather reports being compiled. In addition, improved communications with local law enforcement and emergency managers has led to an increase in the number of severe weather reports being relayed back to the NWS BTV. Furthermore, the structure and orientation of the jet stream, a river of air 20,000 to 30,000 feet above the earth's surface, has been stronger then normal in summertime months across the region. The jet stream separates warm moist air mass to the south, from cool dry air mass to the north, and also moves embedded disturbances riding along the air mass boundary. These factors cause increased lift and more importantly increased wind shear, which helps strengthen thunderstorms to severe level. This weather pattern has been prevalent across our CWA the past couple of years, leading to an increase in severe weather events. The spike in 1998 was caused by several widespread significant severe thunderstorm wind events, which occurred on May 31st and another event happened on July 29th. During 1998 there were almost 100 severe weather wind events reports across WFO BTV forecast area.



Number of Severe Weather Warnings in the Burlington Forecast Area 1986-2008

The image above shows the number of severe weather warnings issued by the WFO BTV from 1986 to 2008. The black line shows a linear increase from the late 1980s to 2008 with regards to the numbers of severe weather warnings issued per year at WFO BTV. The highest number of severe warnings issued was in 2007 with 179 warnings, with a minimum in 1992 and again in 2003. A slight increase in the amount of warnings issued was observed in the late 1990s across our forecast area, due to the arrival of the KCXX (Colchester, Vermont) WSR-88d radar. This radar and the associated technological advancements have enhanced our forecaster's ability to better detect severe weather signatures. This allows the forecaster to pinpoint areas of the worst weather and then concentrate the verification effort on these locations. A relative minimal amount of warnings were issued in the late 1980s and early 1990s due to poor radar detection, and WFO BTV only having warning responsibility for Vermont.



Number of Severe Wind Reports in the Burlington Forecast Area 1986-2008

The image above shows the number of severe wind reports vs. year across WFO BTV CWA. A sharp spike in the number of severe wind reports have been observed over the past 3 years. Over the past 3 years the WFO BTV CWA has average over 125 severe weather wind events. This is nearly 70 reports above the 22 year average of 56 severe weather wind reports. Meanwhile the 7 year average between 1986 and 1992 was just over 33 reports per year. In addition, the frequency of severe hail reports has increased significantly over the past couple of years. For example, between 2006 and 2008 we have average 55 reports of severe hail across our forecast area, while between 1986 and 1992 we only averaged 6.5 reports per year.

This has been a result of more frequent and widespread convective events, along with an increase in trained spotters across northern New York as well as central and northern Vermont. These significant severe weather events include the July 18th 2008 event; the June 10th 2008 wide spread severe weather event, the August 16th and July 9th 2007 severe weather events, and the May 31st 2006 event. The combination of WFO BTV providing SKYWARN training sessions and our office participating in several outreach activities, has increased public awareness of severe weather, while establishing better communications between our office and the users. These activities have resulted in more reports being relayed to our office and better services provided to our users across the region. Finally, the effects of climate change and the correlation to the number of severe weather events and reports across our CWA is still being studied. We continue to investigate large scale synoptic summer time patterns, which are favorable for significant severe weather outbreaks across our region. If current trends continue, the people across the North Country can expect more above average severe weather seasons in the upcoming years.

New Automated Forecast Recordings Telephone Line

By Andy Nash, Meteorologist-in-Charge

Frequent callers to our forecast recording phone line (802-862-2475) may have noticed some changes beginning in mid-September. The office is in the final stages of a transition to a new phone system that is internet based and uses the Voice Over Internet Protocol (VoIP). One of the aspects of the system is that it allows us to better incorporate the technology we already employ to produce our NOAA/All-Hazards Weather Radio broadcasts, and provide additional services to the hundreds of daily callers we get.

With the old phone system, staff had to manually record the three different offerings that we made available: Champlain Valley 7-Day Forecast, Lake and Mountain Recreational Forecast, and the Daily Weather Summary for Burlington. During severe weather or rapidly changing situations, these recordings may not have been updated in the timeliest fashion as the staff was focusing in on other primary duties. In addition, the phone system was only capable of handling two simultaneous calls. Thus when callers needed the information most, they would either find it hard to call in without getting busy signals, or the recorded information may not be the most up to date.

With the new system in place, we have been able to double the number of simultaneous calls as well as offer new information options (see below). Updated information is available much more frequently than before. Certainly the automated voice may take some getting used to, but the advantages of the automated system for both the callers and forecaster staff is far greater. Based on recent caller statistics, on the average day we handle between 400 and 700 calls, with a burst of calls between 5:00 A.M. and 9:00 A.M. each morning. We will continue to make modifications to the new system supporting the forecast recordings to make sure we best meet the needs of the public. Any suggestions are greatly appreciated.

Forecast/Weather Information Recordings (802-862-2475) Menu Tree

Main Menu Options	
Local Forecast Menu Options	1
Recreational Forecasts	2
Burlington Daily Summary	3
Hourly Weather Reports	4
General Weather Synopsis	5
Repeat Options	9
Speak to a Forecaster	*

Local Forecast Menu	
Champlain Valley	1
North Central Vermont	2
Northeast Kingdom	3
Southeast Vermont	4
South Central Vermont	5
Adirondacks	6
St Lawrence Valley	7
Repeat Options	9
Return to the Main Menu	0
Speak to a Forecaster	*

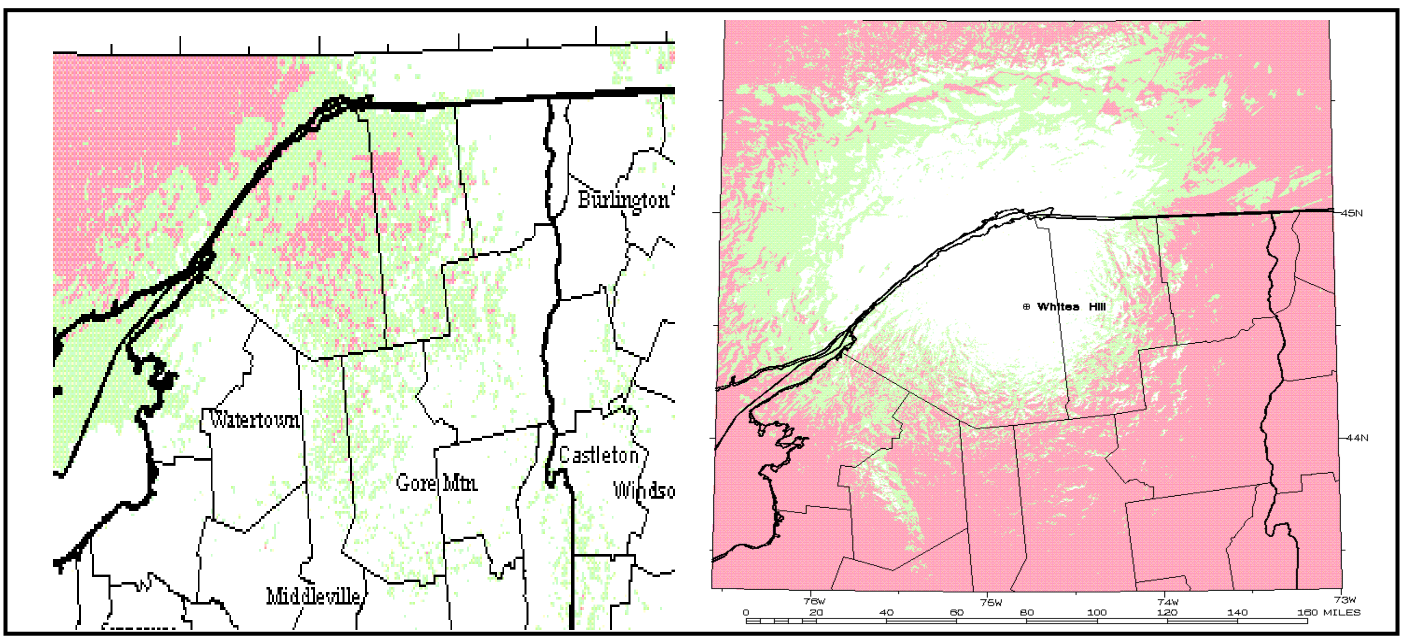
NOAA All-Hazards Weather Radio Network Update

By Andy Nash, Meteorologist-in-Charge

Changes are underway on a couple of fronts to improve NOAA All-Hazards Weather Radio broadcast coverage across Vermont and Northern New York. As some readers of this newsletter may be aware, back in mid-March there was a significant ice storm on the summit of Mount Mansfield that destroyed our primary transmitting antenna for radio station KIG-60 broadcasting at 162.400 MHz. You can read a short summary of the damage at ***http://weather.gov/btv/html/nwr/MansfieldOutage.shtml***.

Although a replacement antenna was put into place, it was not possible to place it at the optimal tower level. This resulted in the signal suffering a more significant block by portions of the summit. This has effectively created a no signal zone, primarily to the south of Mt. Mansfield, while also diminishing the effective range of the signal elsewhere across Northern Vermont. Work is nearly complete on the installation of a new antenna on a different tower. Although there may still be a slight blockage of the signal, the new antenna will be able to handle a higher signal power, so it is hoped that the broadcast strength and clarity of the station will be equivalent to, if not improved over, what it was prior to the ice storm. We expect this new transmitter to go online by next spring, and hopefully before the end of 2008.

The other addition to the NOAA All-Hazards Weather Radio network, waiting to make its debut, will be radio station KPS-508, located on White Hill in Parishville New York. The station is expected to broadcast on a frequency of 162.525 MHz, and will provide coverage across much of the Saint Lawrence Valley of New York (see below). There is no estimated date for this station to go on air as we await final approval from both the US and Canadian authorities, as the projected broadcast area will mean the station will be heard in both countries.



NOAA Weather Radio All-Hazards coverage area in Northern NY by all current transmitters. On the left, the white area indicates a strong signal by the nearest transmitter; green is a partial signal and red is no signal available. On the right, the increased coverage from the new transmitter at Whites Hill, KPS-508 only is shown.

Winter Weather Warnings/Advisories Changes

By Donald Dumont

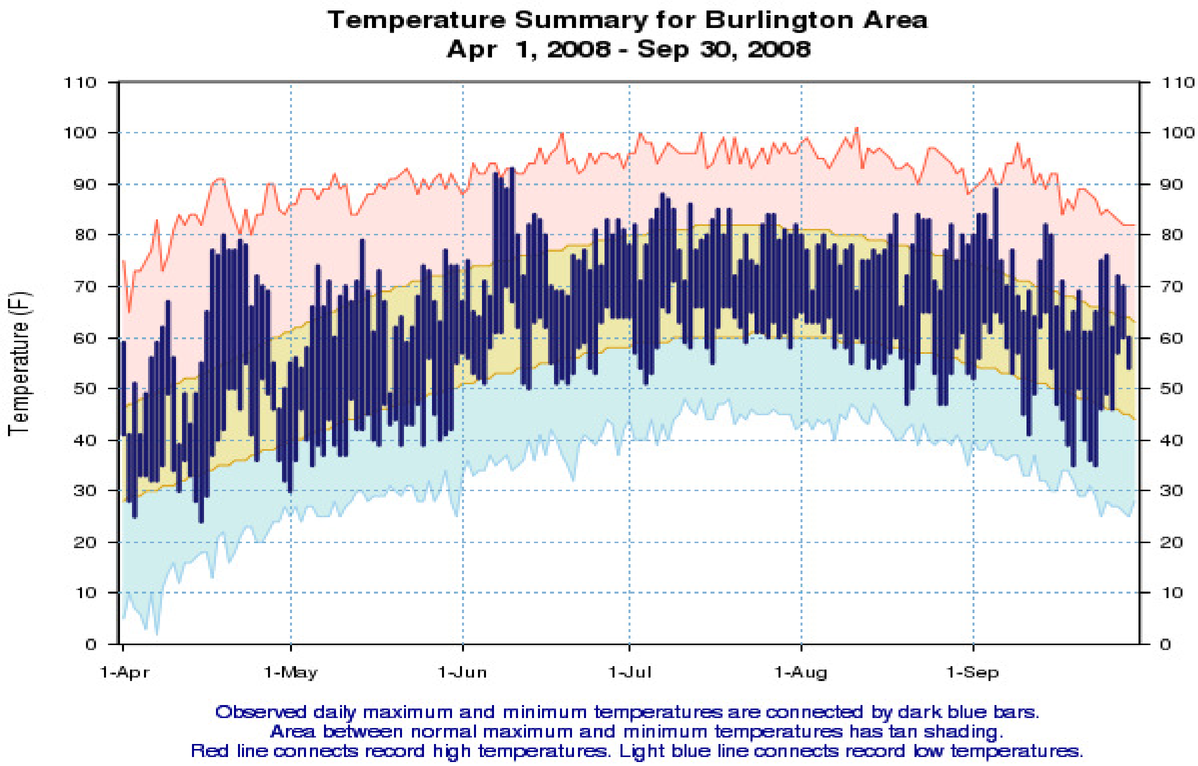
This upcoming winter there will be changes to the suite of products used to advise the public of significant winter weather. The purpose of these changes is to simplify and clarify winter weather hazards to the public. NWS will restructure its winter weather products by combing a number of current advisory and warning products into categories associated with similar impacts. For example weather conditions that use to prompt the issues of a Winter Storm, Heavy Snow, or Sleet Warnings will now be issued as a Winter Storm Warning. The specific hazard information associated with the discontinued product will be clearly depicted in the first line of the body of the advisory or warning product. For example, the NWS in Burlington has issued a Winter Storm Warning for Heavy Snow. Overall the new suite of products will not convey less information to the public, but instead the format will be simpler to use. These changes will reduce the number of specific winter weather warning and advisory products, and enhance clarity among adjoining NWS forecast offices during winter weather events. Also, the www.noaa.gov web graphical depiction of forecast winter weather hazards will be more understandable.

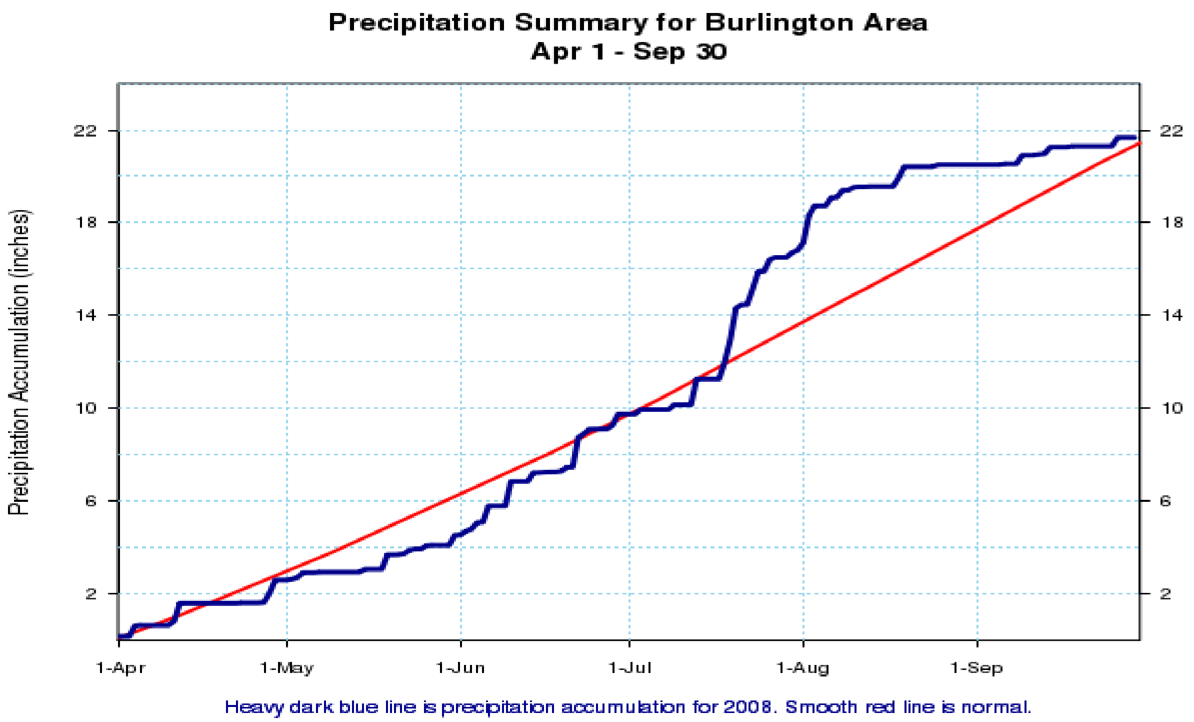
The table below lists past winter weather advisories and warnings on the left hand column with the right hand column listing new advisories and warnings. Text highlighted in blue represents products that have changed since last year. If you have any questions pertaining to these changes do not hesitate to contact us.

OLD WINTER ADVISORIES	CURRENT WINTER ADVISORIES
Freezing Rain	Freezing Rain
Lake Effect Snow	Lake Effect Snow
Lake Effect Snow and Blowing Snow	**Lake Effect Snow**
Wind Chill	Wind Chill
Winter Weather	Winter Weather
Snow	**Winter Weather**
Snow and Blowing Snow	**Winter Weather**
Sleet	**Winter Weather**
Blowing Snow	**Winter Weather**
OLD WINTER WARNINGS	**CURRENT WINTER WARNINGS**
Blizzard	Blizzard
Ice Storm	Ice Storm
Lake Effect Snow	Lake Effect Snow
Wind Chill	Wind Chill
Winter Storm	Winter Storm
Heavy Snow	**Winter Storm**
Sleet	**Winter Storm**

Table 1

Data and Records





VERMONT CO-OPERATIVE OBSERVER PRECIPITATION

SITE	PRECIP/SNOWFALL**					
-----	APR	MAY	JUN	JUL	AUG	SEP
BETHEL 4N	4.53 / 2	0.48	6.92	6.22	4.91	2.59
NWS BURLINGTON	2.60 / .1	1.94	5.21	7.07	3.68	1.20
BROOKFIELD 2SW	3.63 / 0	0.88	5.82	8.40	6.45	M
CANAAN	3.67/1.3	1.31	M	10.02	5.81	2.22
CAVENDISH	3.95/1.6	0.78	5.58	3.80	5.29	5.15
CHELSEA 2 NW	4.45 / 3	0.72	6.54	7.36	6.45	3.50
CHITTENDEN	3.90 / 0	1.54	8.10	6.96	5.25	2.89
CORINTH	4.39/3.6	0.95	5.42	9.32	8.04	3.48
CORNWALL	2.33 / 0	1.08	8.53	6.99	7.38	1.99
DANBY 4 CORNERS	9.57 / 0	1.42	6.05	5.04	6.13	3.67
EAST ALBANY	3.56 / 3	1.32	8.33	8.97	5.11	2.39
EAST HAVEN	3.71/1.3	1.47	6.73	8.19	7.52	1.40
EDEN 2S	3.49 / 6	1.61	7.75	9.36	5.09	2.17
ENOSBURG FALLS	2.47 / T	1.27	4.52	5.47	2.96	1.63
ENOSBURG FALLS 2	3.16 / 0	1.63	6.26	5.15	2.07	1.90
ESSEX JUNCTION 1N	2.43 / .7	2.07	5.65	7.97	4.42	1.56
GILMAN	2.97 / 0	0.65	5.78	6.94	6.45	2.66
GREENSBORO	3.44 / T	2.60	8.45	9.76	6.78	2.22
HANKSVILLE	2.12 / .2	2.51	6.90	8.11	8.28	2.17
ISLAND POND	4.13/3.5	1.66	6.40	8.36	7.92	1.62
JAY PEAK	2.80 / 6	2.10	11.26	6.85	7.29	3.30
JEFFERSONVILLE	3.75/1.5	2.37	6.82	10.01	4.35	3.09
MONTPELIER 2	3.16 / 0	1.16	6.43	8.90	5.95	1.71
MORRISVILLE 4SSW	2.38/2.6	1.07	6.83	10.54	M	1.19
MOUNT MANSFIELD	3.70 / 5	3.62	8.25	12.68	6.72	4.49
NEW HAVEN	M	1.34	7.23	8.59	6.17	2.04
NEWPORT	3.36/2.5	1.49	7.25	6.71	9.89	2.19
NORTH HARTLAND LK	3.70 / .3	0.48	5.49	5.44	3.61	4.15
NORTH SPRINGFIELD LK	3.20 / .5	0.55	5.81	3.05	3.76	4.46
NORTHFIELD	2.76 / 0	1.42	5.31	8.79	6.01	1.67
PLAINFIELD	2.92 / .1	1.34	5.63	8.23	5.69	1.20
ROCHESTER	5.06/2.5	1.16	7.48	7.80	6.57	2.73
RUTLAND	2.60 / .6	1.06	9.90	4.64	5.54	1.88
SAINT ALBANS	2.98/1.1	1.71	5.95	4.74	3.46	2.01
SAINT JOHNSBURY	3.79/1.2	1.96	5.38	9.16	5.53	1.51
SALISBURY 2N	2.79 / 0	1.64	6.20	6.48	7.62	2.43
SOUTH HERO	1.94 / 0	1.39	7.18	7.87	2.81	1.30
SOUTH LINCOLN	2.65/1.7	1.79	7.52	7.65	8.89	2.14
SOUTH NEWBURY	4.17 / 1	0.21	4.46	7.90	4.59	2.94
SUTTON	3.64/4.8	1.63	7.36	9.49	6.50	1.69
SUTTON 2NE	2.98/4.6	2.52	M	9.55	7.35	2.43

UNION VILLAGE DAM		3.69 / T	0.52	4.47	6.38	4.49	2.94
WAITSFIELD 2W		M	M	M	M	M	1.48
WOODSTOCK		3.62 / 0	0.75	4.55	5.22	4.65	M
WORCESTER 2 W		3.15/1.9	1.23	5.20	8.35	7.16	2.66

NORTHERN NEW YORK CO-OPERATIVE OBSERVER PRECIPITATION

SITE		PRECIP/SNOWFALL**					
-----		APR	MAY	JUN	JUL	AUG	SEP
CANTON 4SE		2.75 / T	2.62	5.66	4.28	2.69	2.32
CHAZY		2.13 / 2	1.67	5.95	4.99	3.61	2.16
COLTON 2N		2.79 / 0	3.34	4.79	3.64	2.87	2.84
DANNEMORA		4.05 / 0	2.91	5.77	6.15	4.29	3.17
ELIZABETHTOWN		2.59 / M	0.93	5.08	6.83	3.72	1.48
ELLENBURG DEPOT		2.13/5.5	1.04	5.95	5.18	3.20	3.02
GOUVERNEUR 3NW		3.09 / 0	2.58	7.12	4.90	3.45	2.11
LAKE PLACID 2S		2.35 / 1	2.59	4.09	7.83	3.94	2.22
LAWRENCEVILLE		2.32 / T	3.38	5.92	6.06	M	M
MALONE		2.75 / 1	2.30	4.96	3.93	3.51	3.93
NEWCOMB		3.25 / .9	2.26	4.18	8.07	6.05	2.53
OGDENSBURG 4NE		2.48 / 0	1.19	5.23	7.85	3.10	1.50
PERU 2WSW		1.98 / 2	1.29	4.62	4.03	5.07	0.75
TUPPER LAKE		3.04 / T	2.51	5.25	6.94	3.63	2.50
WANAKENA SCHOOL		2.72 / 0	2.78	4.80	8.14	4.73	M
WILLSBORO 1 N		2.11 / M	0.67	4.15	5.50	5.06	0.95

**** In inches. Precipitation values were compiled locally at the National Weather Service in Burlington, VT. They have not been officially verified by the National Climatic Data Center.**

National Weather Service in Burlington, Vermont.

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Gerald Macke- Operations Program Manager (COOP)

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Web Sites of Interest

Need to know the time?
http://www.time.gov/

The Burlington Weather Forecast Office
http://www.noaa.gov/btv

Information on the Cooperative Observer Program:
http://www.noaa.gov/om/COOP/index.htm

CO-OP Points-of-Contact

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If you need supplies, if your equipment is acting up, or if you need help on procedures, please let us know.

The Champlain Weather Chronicle is a semi-annual free publication from the National Weather Service in Burlington, VT. If you have questions or comments regarding any information contained within, please contact Donald Dumont, editor, at donald.dumont@noaa.gov.